The extraordinary difficulties surrounding this genus are illustrated by the fact that Mr. Bather himself at one time described the arm of a *Streptocrinus* as the stem of *Herpetocrinus* (p. 176).

Controversial matters are treated in this paper with the delicacy of the duellist rather than with the tactics of the football-field; and Mr. Bather may be congratulated on the position he has gained among the exponents of intricate research. We look forward with keen interest to the completion of this handsome memoir.

G. A. J. C.

A DEDICATORY NUMBER OF THE QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE.

A SPECIAL complimentary number of *The Quarterly Journal of Microscopical Science* has been issued, dedicated by his colleagues to Prof. E. Ray Lankester, F.R.S., in celebration of the completion of twenty-five years of editorship. The *Journal* contains contributions by Dr. E. Klein, F.R.S., Prof. A. G. Bourne, Mr. Adam Sedgwick, F.R.S., Mr. W. C. McIntosh, and Prof. A. A. W. Hubrecht, of Utrecht University. It is prefaced by the subjoined historical sketch, signed by Mr. Sedgwick and Prof. Weldon.

It is now five-and-twenty years since Prof. Lankester first undertook the task of editing the *Quarterly Journal of Microscopical Science*, and by issuing the present number his colleagues desire to mark the occasion, and at the same time to take the opportunity of offering to him their hearty congratulations on the success which has attended this quarter of a century of effort on his part.

The *Journal* was founded in the year 1853 by the publisher, Mr. S. Highley, and was edited by Dr. Edwin Lankester and Mr. George Busk. In 1856 the publisher's business was transferred to Mr. John Churchill, with which firm it has remained ever since. Up to 1868 the *Journal* published the "Transactions of the Royal Microscopical Society of London," but in 1869 the Society started its own publication, and a new editorial arrangement of the *Journal* was made. Mr. George Busk retired, and Mr. Ray Lankester, who had lately taken his degree at Oxford, joined his father in the editorship.

Mr. Ray Lankester's connection with the *Journal* began in 1863 with the publication of a paper on "Our Present Knowledge of the Gregarinæ," followed in 1864-5 by a memoir, in three parts, on "The Anatomy of the Earthworm." In 1865 he suggested the publication of a quarterly chronicle of the progress of histology and microscopic investigation, and joined Mr. Busk in its preparation. Curiously enough, this feature has been abandoned since 1872, whilst the Royal Microscopical Society has taken the task in hand, and produces an admirable and extensive record.

In 1872 Ray Lankester's father ceased to take part in editing the *Journal*, and was succeeded by Dr. J. Frank Payne. Lankester and Payne added Mr. Thiselton Dyer (now Director of Kew Gardens), to their editorial body in 1873, and he was succeeded in 1876 by Mr. Archer, of Dublin, the Secretary of the Dublin Microscopical Club, and the author of so many interesting discoveries among freshwater Rhizopoda. In 1877 Dr. Payne retired, and Dr. Klein joined the editorial staff.

In 1878 a further change was made. Prof. Lankester became sole editor, with the co-operation of Archer, Francis Balfour, and E Klein. This arrangement has continued ever since, with various changes in the list of those co-operating. Thiselton Dyer returned for a few years as one of those giving his co-operation; and Moseley and Milnes Marshall have in turn assisted in the conduct of the *Journal*, and have published in it many of their most important papers, inducing their pupils to adopt the same mode of publication.

The number of contributions which this energetic policy attracted to the *Journal* soon made it necessary to enlarge it; and the term of Lankester's editorship has been marked by a continuous increase in the amount of letterpress and in the number and excellence of the plates. This has of necessity been accompanied by a rise in price. The original price was four shillings per number—the numbers being issued quarterly. At that time the volume consisted of some eight-and-twenty demy octavo sheets and twenty plates, mostly also octavo. The last volume contained thirty-six royal octavo sheets and forty-two plates, many of which were coloured, while the majority were of quarto size. The change from demy to royal octavo was effected at the commencement of 1883, and in 1890 the strict quarterly publication of the *Journal* was abandoned, so that more than four numbers could be issued in the year. During the eleven years which have elapsed since 1883, sixty-one numbers, divided into fifteen volumes, have been issued; so that the increase in size and price has not only affected the magnitude of each number, but has been accompanied by an increased rapidity of publication.

Every reader will remember that Prof. Lankester's energy has by no means been exhausted in merely editing the *Journal*, for besides his many writings elsewhere, he has published more than sixty memoirs in the pages of this *Journal* alone; and we may, perhaps, be permitted to mention a few of the more prominent of these—such as that on "The Development of the Pond Snail" (1874), which marks the starting-point of his well-known investigation of the development of Mollusca; the "Notes on the Embryology and Classification of the Animal Kingdom" (1877), which exercised so great an influence upon the whole tendency of morphological speculation; the descriptions of Limnocodium (1880); the series of memoirs on Apus and Limulus (1881–1884), and on Rhabdopleura (1884); the first description of the atrio-cœlomic funnels in Amphioxus (1875), and the subsequent memoir on the anatomy of the same animal, together with the account, commenced in conjunction with his pupil, Mr. Willey, and continued by Mr. Willey alone, of the later history of its remarkable larva.

It would be useless to enumerate all the naturalists who have contributed to the *Journal* since Prof. Lankester's successful enterprise has made it the chief medium of publication for English morphological work; but it is interesting to notice that the contributors have constantly included foreign naturalists of distinction, including E. van Beneden, Bowditch, Carrière, Claparède, Dollo, Giard, Hubrecht, Iijima, Ischikawa, Kingsley, Mitsukuri, H. F. Osborn, Oudemans, Packard, Patten, Pelseneer, Pouchet, Ranvier, Whitman, and others. Some of these have taken the opportunity, by contributing to the present number, of joining in the hearty congratulation on his past achievement, and sincere good wishes for the future, which Prof. Lankester's associates now offer to their chief.

NOTES.

THE following fifteen candidates were selected on Thursday last by the Council of the Royal Society, to be recommended for election into the Society:—Mr. W. Bateson, Mr. G. A. Boulenger, Dr. J. R. Bradford, Mr. H. L. Callendar, Prof. W. W. Cheyne, Mr. R. E. Froude, Prof. M. J. M. Hill, Prof. J. V. Jones, Mr. A. E. H. Love, Mr. R. Lydekker, Mr. F. C. Penrose, Dr. D. H. Scott, Rev. F. J. Smith, Mr. J. W. Swan, and Mr. V. H. Veley. We print their qualifications in another column.

THE "Ladies' Conversazione" of the Royal Society is announced for Wednesday, June 13.

THE death is announced of Dr. E. H. Vinen, at the age of sixty-nine. He was a Fellow of the Linnean Society, and well known among botanists and geologists.

WE regret to learn of the following deaths among scientific men abroad:—Dr. Louis von Uslar, Professor of Pharmacy in the University of Göttingen; Dr. A. Schmidt, Professor of Physiology in the University of Dorpat (or Jurieff); and Prof. Thomas Morong, the well-known botanist.

THE Council of the British Medical Association are prepared to receive applications for grants in aid of researches for the advancement of medicine and the allied sciences. Applications for sums to be granted at the next annual meeting must be made on or before June 15 in writing, addressed to the General Secretary, at the office of the Association, 429, Strand, W.C. They must include details of the precise character and objects of the research which is proposed. Reports of work done by the assistance of Association grants belong to the Association. Instruments purchased by means of grants must be returned to the General Secretary on the conclusion of the research in furtherance of which the grant was made. The Council of the Association are also prepared to receive applications for one of the three Research Scholarships which is vacant, of the value of £150 per annum, tenable for one year, and subject to renewal by the Council for another year.

A LECTURE on "Recent Discoveries at Koptos," with illustrations, will be delivered by Prof. Flinders Petrie at University College, Gower Street, on Saturday, May 26, at 2 p.m. These discoveries include the long-sought rise of Egyptian art, and the prehistoric remains of the race on entering Egypt. The lecture will be free to the public without ticket.

AT the annual general meeting of the British Ornithologists' Union, held on Wednesday, the 9th inst., Lord Lilford was re-elected President, and Mr. F. D. Godman Secretary, for the ensuing year, and Lieut.-Colonel L. H. Irby and Mr. W. T. Blanford, F.R.S., were placed on the committee in lieu of two retiring members. It was agreed that a new (seventh) series of *The Ibis* should be commenced in 1895 with the thirty-seventh volume, and that Dr. P. L. Sclater, F.R.S., and Mr. Howard Saunders should be appointed as joint editors of it.

IT is impossible to speak too highly of the part taken by the Smithsonian Institution in diffusing knowledge. Not the least important of the methods adopted to make the works of men of science known unto the ends of the world, is the inclusion of miscellaneous reprints of memoirs in the annual reports of the Institution. A report just received shows the operations, expenditures, and condition of the Institution in 1892, and contains an appendix of the kind referred to. Therefore it is useful and interesting to all engaged in the promotion of knowledge. Of the thirty-three papers appended to the report, six have been reprinted from NATURE, and, we need scarcely say, proper acknowledgment of the source is given in each case. There are several translations of important papers, among them being Prof. J. A. Palmén's report on the migration of birds, presented to the second International Ornithological Congress in Budapest in 1891; and translated extracts from an ornithological essay on the flight of birds, by M. L. P. Mouillard, published in Paris in 1881 under the title "L'Empire de l'Air." Other contributions calling for special mention refer to the geological history of the Yellowstone Park, Mr. W. Woodville Rockhill's explorations in Mongolia and Thibet, and the progress of astronomy during 1891 and 1892.

THE recent publication of several important works has brought into prominence the subject of the theory of functions. Those who are interested in this branch of mathematical science will therefore be glad to know that Messrs. Mayer and Müller, of Berlin, intend to publish, in about eight volumes, the collected papers of Herr Karl Weierstrass, who has been termed the creator of the modern theory of functions. The work will be issued under the auspices of the Königlich Preussischen Akademie der Wissenschaften, and it is with the sanction of Prof. Weierstrass himself that this edition of his collected mathematical works is allowed to see the light. Messrs. Mayer and Müller rightly ground the importance of this publication on the name of the author. The first part is to contain memoirs already published, or which are ready for publication, in three volumes, the papers being printed in chronological order. The series is to open with "the development of the modular functions" which was presented to the Prüfung's-Commission at Münster in 1841. This part also contains the Braunsberg School programme, the fundamental importance of which in the theory of the Abelian functions is well known. The second part is to consist of five volumes, and will include the greater part of the lectures delivered in the University of Berlin. In the first volume of this part is the lecture based on "the Theory of the Elliptic Functions," which was delivered for the first and only time in the Professor's sixtieth year (*cf.* Forsyth, cap. v.-vii.) The theory is here established on Euler's Addition-theorem. The lecture closes with an application to several geometrical and mechanical problems. A later volume contains "the general Elliptic Transcendents," as well as a detailed discussion on the transformation of elliptic functions. The theory of the Abelian functions occupies the remaining volumes, one of which is devoted to a special discussion of the theory of the so-called hyperelliptic functions. The lectures are to be edited by a former pupil of Prof. Weierstrass, who, however, will himself supervise the publication. The work is to come out in quarto volumes, and great care is to be bestowed on their production. It is expected that all the volumes will be issued in a few years.

PROF. W. C. MACKENZIE, of the College of Agriculture, Ghizeh, has sent us some interesting information with regard to the existence of nitrate of soda in Egypt. It appears that the natives of Upper Egypt, from Keneh to Esneh, are in the habit of carrying a substance called "tafl," from the hills on the east side of the river, to manure their fields, especially the maize crop. That this was done seems to have been well enough known to many people in the habit of spending some time there, but beyond a casual knowledge of the fact that the "tafl" was used as a manure, no further interest seems to have been taken. What the valuable ingredient was, does not seem to have been known, and the name "tafl" was used indiscriminately for clay for pottery and clay for manure. Analyses of several samples of this substance showed, however, that they contained nitrate of soda from 2 per cent. to 18·5, mixed with varying proportions of chloride and sulphate, as well as calcium carbonate and clay. Further examinations of other samples did not show such a high percentage, the richest containing only 4 per cent. Prof. Mackenzie visited the deposit in the hills east from Luxor, and some eight miles distant from the town across the desert, and there found the "tafl" right on the face of a limestone hill, apparently cropping out of the rock. Samples taken at different heights gave percentages varying from 2 to 9·5 of nitrate of soda. On sending in a report about this nitrate, Nubar Pasha, the present Prime Minister, arranged to send up Mr. E. A. Floyer and Prof. Sickenberger to investigate the whole question, and endeavour to estimate the quantity. The investigation will no doubt throw considerable light on the origin of this curious occurrence of nitrate. Prof. Mackenzie thinks that the idea that the clay has simply acted as an absorbent for nitrates got from accumulations of potsherds, &c., does not seem possible, for at Luxor there is no evidence of this whatever, the deposit of nitrate-bearing clay being at the foot of a limestone cliff, and no appearance of potsherds anywhere. He believes that more probably caves or swallow-holes in the limestone cliffs have collected clay and organic matter from the river, and the nitrification of this organic matter has produced the nitrate where it is now found. Messrs. Floyer and Sickenberger's report will, however, no doubt clear this point up.

AMONG the shorter contributions in the May number of the *Psychological Review* is one by Prof. W. O. Krohn on the relation of sensation-areas to movement. He had the opportunity of testing the sensitivity of the skin of a man who had had his left forearm encased in a plaster-of-paris case for a period of three months. During this entire period the forearm could not be moved either at the wrist or at the elbow. Prof. Krohn compared the sensitiveness of the skin of the uninjured right forearm with that of the left forearm of the same person, after the plaster case had been removed, by means of the usual æsthesiometric tests. He found that on the latter forearm the one so long unmovable, when the two points of a pair of dividers or compasses, touching the skin at a given locality, were separated by as much as fifty-five millimetres, they were felt as one instead of two; while on the right forearm they only had to be about twenty millimetres apart in order to be perceived as two. On the back of the left arm, at a different locality from that just mentioned, it was found that even when the two points of the dividers were seventy-five and eighty millimetres apart, they were felt as one; while at a corresponding locality on the right arm the skin was so sensitive that points but 17 mm. apart could be felt as two. It should be mentioned that the subject was practically ambidextrous before meeting with the accident which led to the casing of his arm in plaster. Prof. Krohn thinks, therefore, that the sensitivity of the skin over the injured forearm was lost simply because that member was for so long a time immovable. He points out that this has an important bearing upon the principle that "the localising power is delicate in proportion as the skin covers a movable part of the body."

AN "Atlas of the French Lakes" has been in progress since 1886, under the auspices of the Ministry of Public Works in France. It is now completed, and published in ten sheets, with coloured contour-maps of the French lakes, great and small. Lake Geneva, partly done by Swiss surveyors, is drawn to scale 1/50,000, Lake d'Annecy to scale 1/20,000, and the others 1/10,000. Several results of general interest are obtained—for example, the regular spherical shape of old crater lakes in the Auvergne district, the shallowness and irregularity of lakes at the outflow of a glacier, such as Lake Sylans in the Ain Department; again, the filling-up of lakes at the inflow of the river, typically shown by Lake Brenets, in the course of the River Doubs. The work has been accomplished by M. André Delebecque, Civil Engineer of Bridges and Roads, assisted by his colleagues MM. Garcin and Magnin. The day has yet to come when our Government will authorise a similar special work on British lakes.

So little is known about the origin of many infectious diseases that an article by Dr. Keser, in the *Medical Magazine* for May, will be read with interest. The chief reason why the matter is in obscurity is that the descriptions of diseases found in the works of early writers do not afford the necessary means of identification. A noteworthy exception to this, however, is Thucydides' narrative of the plague of Athens. The author gives a graphic account of an acute well-marked epidemic disease which invaded Athens in the year 430 B.C., appearing unexpectedly amongst healthy people, and destroying the lives of many thousand inhabitants during the three years that it lasted. It has been supposed by some that the disease was small-pox, while others have considered it to have been a malignant form of scarlatina or typhus. A careful review of the facts and evidence, however, leads Dr. Keser to believe that the plague of Athens was probably a variety of the true Oriental plague, characterised chiefly by a varioliform exanthem with redness and lividity of the skin, by ulcers, and by the absence or rarity of buboes. The connecting links between this form of the plague and the typical *Pestis inguinaria* still remains a matter of conjecture.

THE April number of *Das Wetter* contains an article on sun-spots and weather, by P. Polis, based on sixty-four years' observations at Aix-la-Chapelle (1830-93). The author has tabulated Wolf's relative sun-spot numbers, together with the yearly, winter, and summer mean temperature values, the number of thunderstorms and annual rainfall, and has also represented the values graphically. The curves show that down to the year 1878 the summer and annual mean temperatures decrease with greater sun-spot frequency, and that an increase of summer and yearly temperature occurs with a decrease of sun-spots. The winter temperature curve also agrees generally with the other two. From the year 1878 the temperature curves are reversed, a decrease of sun-spots corresponding with a fall of temperature, and *vice versâ*. The rainfall curve is irregular, but it appears, contrary to results obtained elsewhere, to take exactly an opposite course to that of the sun-spots. The number of thunderstorms increases generally with a decrease of sun-spots, and *vice versâ*.

FOR some years past, Prof. Klossovsky, Director of the Meteorological Observatory of Odessa, has been actively engaged in collecting and discussing observations bearing on the climate of south-west Russia, and the observers co-operating with him amounted in 1892 to 1900 in number. A valuable paper on the climate of Odessa has recently been published (in Russian), from which it appears that the mean annual rainfall for 1866-92 was about 17 inches; the wettest month during this period was June 1886, in which the rainfall was 6·6 inches, while in September 1892 no rain fell. The annual mean temperature was 50°·2; the maximum was 95°·4, and the minimum −18°·8, giving an annual range of 114°·2. Several papers have also been published, bearing upon the agriculture of the district, including phenological observations, and also the occurrence of sandstorms, which are frequent in that part of Russia.

A RECENT number of the *Comptes Rendus* contains a paper by M. R. Swyngedauw, on the ratio of the currents produced by the discharge of a condenser in two circuits placed in parallel, one containing a spark-gap and the other self-induction. The apparatus employed by the author consists of a battery of two Leyden jars charged by a Holtz machine. The conductor which joins the coatings of these jars contains (1) a spark gap I_1; (2) a coil T which is traversed by the whole discharge Q_T; (3) two branch circuits, one containing a coil D exactly similar to T, the other containing a spark-gap I_2. The two coils T and D are identical, and can be placed either simultaneously or separately on the cross-bar of a Wiedemann-d'Arsonval galvanometer. Thus, by placing first the coil T and then D on the galvanometer, the total quantity of electricity discharged, or the fraction which passes through the branch circuit containing the coil, can be measured. The author finds that if the sparking distance I is left constant, that the quantity of electricity passing through the branch circuit containing the coil increases continuously as the spark interval I_2 is increased. When the spark interval I_2 passes a certain limiting value, the quantity of electricity passing through the branch coil is greater than that passing through the coil T. This anomalous increase might be considered to be due to a dissymmetry in the spark-gap I_2, so that oscillatory currents set up in the branch circuits would pass one way but not the other. The author finds, however, that if this spark-gap is changed, or the direction of the discharge changed, the increase is still observable.

AN elaboration of the presidential address delivered by Dr. D. Christison in November 1892, before the Botanical Society of Edinburgh, has just been published in the Society's *Proceedings* (vol. xix. part 3). The subject of the address was the actual size of the largest trees of species, native or long-naturalised, in Britain, particularly in Scotland, with a discussion of the question of their probable age. At the end of the paper Dr. Christison dispels a few pleasing illusions with regard to some historic trees. It is chiefly the oak, among trees, that has been associated with historic deeds, and perhaps none has acquired such fame as the Boscobel oak, reputed to have concealed Charles II. after the battle of Worcester in 1651. Dr. Christison says that an inscription which was placed against the present tree in 1875 certifies:—"This tree, under the blessing of Almighty God, had the honour of sheltering from his foes King Charles II." But, it is pointed out, Mr. R. F. Collins (*Trans. North Staffordshire Field Club*, 1890) has shown that this tree, being only eleven feet ten inches in girth, could not have been the pollard oak of nearly two and a half centuries ago, and that a previous inscription in 1817 testified that "the present tree sprung, it is said, from the above tree" (meaning the Royal tree). Previous inscriptions were also referred to, from which it seems that the original tree disappeared soon after 1787. Indeed, Dr. Stukely recorded that in 1713 "the tree was in the middle almost cut away by people who came to see it." As to historic hawthorns, one is credited with having witnessed the death of Lord Maxwell at the Battle of Dryfe Sands, and several have been associated with Mary Queen of Scots; but Dr. Christison remarks that it is scarcely possible that any hawthorn could exist for three hundred years, as the species rarely exceeds a very moderate size, and his observations show that it grows at a fair average rate.

MR. THOMAS CARROLL's general report on the Irish Agricultural Department during 1892, published a few weeks ago, contains the results of experiments carried out under his direction, having for their object (1) the determination of the mode by which the disease *Phytophthora infestans* reaches the tubers of the potato plant, and (2) the examination of measures for the prevention of, or for the lessening the effects of the disease upon the crop. The point upon which information was especially desired was, whether the disease producing Mycelium reached the tubers of the potato plant through the aerial and underground stems, or by means of the disease-producing spores falling upon the ground, and being carried through it to the surface of the tubers. To test this, a portion of ground upon which potatoes were growing was covered beneath the potato stems and leaves with a layer of cotton wool. This cotton wool was carefully placed around the stems, and every means used to have the ground perfectly covered with it, with the view of filtering out the spores that might fall upon the ground. No diseased potatoes were found on plants protected in this manner, whereas many occurred on plants grown in ground not covered with cotton wool. These experiments, which were very carefully carried out, serve to indicate that the disease is carried to the tubers of the potato plant through the spores which cause the disease being taken through the earth to the tuber, and not by means of the Mycelium finding its way to the tubers through the stem of the plant. An experiment, having for its object the testing of the effect of removing the stalks of potatoes upon the appearance of disease, with the view of preventing the tubers from being affected, was carried out at the Ballacutranta School Farm, County Sligo. This system of removing the potato haulm upon the appearance of the disease has frequently been recommended as a preventive. To test it, two plots of ground bearing a crop of potatoes were marked out for experiment. On one the stalks were removed; on the other they were allowed to remain. A comparison of the weights of the crops in each case, and the amounts of diseased tubers, shows, however, that through the removal of the potato haulm, before the crop was matured, the yield of crop was lessened without commensurate benefit in freedom from disease.

MR. GEORGE S. PERRIN has sent us a paper on "Australian Timbers," read before the Royal Victorian Institute of Architects in September 1893, and having special reference to the ornamental and decorative woods of Australia.

Bulletins Nos. 48, 49, and 50 have been sent out from the Purdue University Agricultural Experiment Station. They contain the results of experiments with small fruits; a history of the attempts that have been made to establish the sugar-beet in America, with a statement of the conditions required for its successful cultivation; and the results of some field experiments, by Prof. W. C. Latta, with Indian corn and oats. The *Bulletins* are sent free to all agriculturists in Indiana who desire them, and their contents are found invaluable.

ON April 18 the Geological Survey of Alabama attained its majority—twenty-one years—under the present management. It has been thought desirable to mark this occasion by some sort of permanent memorial, and to this end maps are in course of preparation showing the condition of knowledge of the geology of the State at the beginning and at the end of the period 1873-1894, and columns showing the relative amounts of raw materials and of finished products from Alabama mineral resources at the same times, are also in preparation. In the line of this design a sketch has been prepared by Mr. E. A. Smith, showing the origin and progress of the survey, the difficulties under which it has laboured, what it has accomplished, what it has cost, and what it yet hopes to accomplish.

A LIST of apparatus for the psychological laboratory designed by Prof. J. Jastrow, and made by the Garden City Model Works, Chicago, has been received. It comprises descriptions of æsthesiometers, for determining the distance upon the skin at which two points are just perceived as two; pressure attachments, for testing the pressure sense of the skin; apparatus for the sense of roughness and smoothness; apparatus for all kinds of reaction experiments; an arrangement for testing the appreciativeness of changes of temperature; others for recording involuntary movements; and for testing memory. The character of some of the apparatus shows that experimental psychology and physiology overlap to a large extent. Indeed, it is often difficult to define the limits of psychological and physiological research. Like many other branches of science, these two merge into one another, and their peculiar provinces of investigation are comparatively small.

The fourth volume of the *Proceedings* of the Chester Society of Natural Science and Literature, which has just been published, contains a number of very interesting articles by several well-known men of science. It is a matter for regret that the publication of some of the papers has been so long delayed. For instance, we note that a paper by Prof. T. McKenny Hughes, F.R.S., on the Silurian Rocks of North Wales, was read before the Society in January 1886, and another, on caves and cave deposits, in October of the same year. Mr. A. O. Walker contributes to the volume some notes on the natural history of the Chester district, from 1879 to 1893, a paper on the climate of Chester, and one on that of the North Coast of Wales. The Heron, and Heronries of Cheshire and North Wales, forms the subject of a contribution by Mr. R. Newstead, who also gives a preliminary list of the mammals of the same district. Another important list gives the results of observations on the occurrence and distribution of birds in different parts of West Cheshire, Denbighshire, and Flintshire. This list was drawn up by Mr. W. H. Dobie, and is accompanied by a map. From this brief description it will be seen that the Chester Society of Natural Science is doing something to promote the study of natural knowledge. We are glad to learn that the Society is in a very flourishing condition, the number of members being at present over six hundred.

THE Society for the Protection of Birds have added to their list of publications a pamphlet by Mr. W. H. Hudson, entitled "Lost British Birds." The species described as lost by Mr. Hudson are those of which the British race is extinct, or very nearly so. The list includes the Crane, White Spoonbill, Capercailzie, Avocet, Great Bustard, Blacktailed Godwit, Great Auk, Red Night reeler, Bittern, Marsh Harrier, Ruff and

Reeve, and Hen Harrier. Though it may be thought a little "previous" to refer to some of these species as lost, there are others, such as the Goshawk, Night Heron, Little Bittern, and Baillon's Crake, not included in the list, but which there is reason to believe were once summer residents and breeders in Great Britain. It is often remarked that the total disappearance of some species of birds, and the extreme rarity of others once common in this country, is due to the draining of marshes and similar changes on the face of the land. But the facts brought together by Mr. Hudson show that the disappearances have been mostly brought about by the direct action of those inveterate bird-destroyers, described as "The Cockney sportsman, who kills for killing's sake; the gamekeeper who has set down the five-and-twenty most interesting indigenous species as 'vermin' to be extirpated; or, third and last, the greedy collector, whose methods are as discreditable as his action is injurious." If these and others who have helped to degrade the character of our bird-population will read Mr. Hudson's little pamphlet, they will see the greatness of the change that has taken place.

FURTHER interesting properties of sodium peroxide are described in the current *Berichte* by Prof. Poleck, of Breslau. It is shown that sodium peroxide rapidly reduces salts of gold, silver and mercury with separation of the metal and evolution of oxygen gas. Platinum, however, is not precipitated from chloroplatinic acid or chloroplatinates until they are decomposed with a silver salt, when reduction both of the resulting platinum chloride and of the silver chloride occurs, both metals being precipitated. Ferric hydroxide is precipitated, as might be expected, from both ferrous and ferric salts; from manganous salts manganese dioxide is precipitated, presumably hydrated, and from salts of cobalt the higher cobaltic oxide. Permanganates are reduced to manganese dioxide, but chromic oxide is oxidised to chromic acid. The separation and quantitative estimation of iron and chromium or manganese and chromium are easily achieved by utilising these reactions, for iron is precipitated as ferric hydroxide and manganese as peroxide, while chromium remains in solution as chromate of sodium. Sodium peroxide also produces the highly oxidised sodium peruranate, $Na_4U_2O_8 + 8H_2O$, directly from salts of uranium, and it may readily be isolated by addition of alcohol which precipitates it. It is also interesting that iodine is oxidised on warming directly to the difficultly soluble acid sodium periodate, and upon decomposition of this salt with silver nitrate the normal silver periodate is at once produced, and free periodic acid $HIO_4 + 2H_2O$ may be readily obtained from it in large crystals by decomposition with bromine and subsequent evaporation *in vacuo*. Potassium ferricyanide behaves towards sodium peroxide in a similar manner to its action with hydrogen peroxide, reducing it energetically to ferrocyanide, and the volumetric process of Kassner can be readily carried out by use of it. Sodium peroxide reacts with lead oxide in presence of water to produce a plumbate of sodium of the composition $Na_2PbO_3 + 4H_2O$. Organic compounds dissolved in alcohol are usually very rapidly oxidised by sodium peroxide, while the alcohol itself is not attacked. Ether, on the contrary, at once ignites when brought in contact with the peroxide. Prof. Poleck recommends its use likewise in the separation of arsenic, antimony and tin, for the sulphosalts of these elements are at once oxidised by sodium peroxide in presence of water to oxygen compounds, the whole of the sulphur being simultaneously converted into sulphuric acid. Hence in toxicological investigations it is only necessary to oxidise the sulphosalts with sodium peroxide before proceeding immediately to employ Marsh's test. The practical uses of sodium peroxide appear indeed to be very numerous, and the information now rapidly accumulating concerning it will doubtless prove of value both from the theoretical and the technical point of view.

IN our note concerning the atomic weight of barium (vol. xlix. p. 562), the statement that "the highest and lowest individual values obtained among the whole fifty separate estimations were 137·42 and 137·45" should have read "the highest and lowest of the mean values obtained from the different series of estimations were 137·42 and 137·45."

THE additions to the Zoological Society's Gardens during the past week include a Mozambique Monkey (*Cercopithecus pygerythrus*, ♀) from South-east Africa, presented by Mr. H. Tattenhall; two Laughing Kingfishers (*Dacelo giganteus*), two Berigora Hawks (*Hieracidea berigora*) from Australia, presented by Mr. A. E. Henniker; seven Spanish Blue Magpies (*Cyanopolius cooki*) from Spain, presented by H.R.H. the Comte de Paris; a Tuatera Lizard (*Sphenodon punctatus*) from New Zealand, presented by Dr. W. J. Mackie; an Egyptian Terrapin (*Trionyx ægypticus*) from West Africa, presented by Mr. F. W. Marshall; a Green Lizard (*Lacerta viridis*) European, presented by Miss S. Borgaes, a Yellow-billed Sheathbill (*Chionis alba*) from Antarctic America, a Red and Blue Macaw (*Ara macao*) from South America, a Black Iguana (*Metopoceros cornutus*) from San Domingo, a Geoffroy's Terrapin (*Hydraspis geoffroyana*) from Trinidad, seven Say's Snakes (*Coronella sayi*) from North America, deposited; a Derbian Wallaby (*Halmaturus derbianus*, ♂) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

FINDER-CIRCLES FOR EQUATORIALS.—A very ingenious and what may prove a most useful addition to an equatorial are the so-called star-dials or finding-circles, a brief account of which is contributed to the current number of the *Zeitschrift für Instrumentenkunde* (4 Heft, April 1894). Every worker with the equatorial will no doubt at some time have found out that the present mode of setting the instrument on some object, as, for instance, a star, is not always very convenient, and in addition employs comparatively far too much time. The object of these finding-circles is to reduce this time very considerably, and a use of three years has shown that its aim has been successfully attained. The instrument to which it has been applied is the 12-inch of Georgetown College Observatory, Washington. On the pillar of this instrument are the two hand-wheels, by means of which the telescope is moved in right ascension and declination, and also two microscopes for reading the R.A. circle. Both axes of the telescope carry the usual circles for orientation, each being graduated in fine divisions on silver and large white divisions on a dark background. The finding-circles are situated just above the hand-wheels mentioned above, and fixed to the pillar, looking like a pair of aneroid barometers or steam gauges; they are arranged as follows:—The circular divided disc, with the declination divisions arranged round its circumference, is fixed firm in its case, and the index is so geared to the telescope that any movement of the latter is recorded on the dial; this gives one directly the declination. In the case of the other dial, that for right ascension, the disc is divided into two circles of twelve hours each, and instead of being fixed is moved by clockwork, sidereal time being shown on its face by means of another index; this latter index responds also to the movement of the telescope, but is quite independent of the first one. It will at once be seen that with these two dials so conveniently placed the telescope can be at once oriented, while the question of hour-angle is entirely eliminated.

THE HARVARD OBSERVATORY IN PERU.—An historical sketch of the establishment of the Peru branch of the Harvard College Observatory, and the investigations carried on there, is contributed to the *Harvard Graduates' Magazine* for March by Prof. W. H. Pickering. The Observatory is situated about two miles from Arequipa, and four hundred feet above it, on the slopes of Mount Chachani. It is furnished with a very complete instrumental outfit, the most important instrument being a 13-inch equatorial, capable of being used for either visual or photographic purposes, and an 8-inch photographic telescope. Five meteorological stations have been established by the Observatory. One is at Mollendo, on the sea-coast, 100